**10 Important Themes at the Forefront of**

**Developing Sound Statistical Reasoning**

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| **1.** Statistics is about variability, context, and answering a question that requires data. |
| **2.** Identify whether the data are categorical or quantitative (numerical). |
| **3.** Use distributions to identify the key features (such as patterns in variability) of the data collected. |
| **4.** Distinguish between a population distribution, a sample data distribution, and a sampling distribution. |
| **5.** Use distributions to compare two or more groups. |
| **6.** Look for an association between two variables (pattern or trend in bivariate data) and use values of one variable to predict values of another variable. |
| **7.** Distinguish between the three types of study designs for collecting data (sample survey, experiment, and observational study) and know the scope of interpretation for each design type. |
| **8.** Understand that when randomness is incorporated into the sampling or experimental procedure, probability provides a way to describe the ‘long-run’ behavior of a statistic as described by its sampling distribution. |
| **9.** Distinguish between the role of randomness (reducing the effect of bias) and the role of sample size (precision) with respect to using a statistic from a sample to estimate a population parameter. |
| **10.** Ask if the difference between two sample proportions or two sample means is due to random variation or is the difference significant. |